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NUTRITIVE VALUE OF SOYBEANS AND SOYBEAN PRODUCTS

The soybean, which has been utilized for many centuries in the orient, has recently gained favor in this country as an article of human food. It deserves wider recognition, since it is a good source of the minerals calcium, phosphorus, and iron, has a high content of protein of good quality, and in the dry soybean especially, a high content of easily digestible fat. It is a good source of vitamin B, a fair source of vitamin G, and contains some vitamin A.

Analyses show that only part of the carbohydrate in the soybean is in a form which is generally thought to be utilized by the body. About 8 per cent of the dried soybeans, and about 5 per cent of the fresh soybeans is in this form. The low content of "available" carbohydrate makes the soybean an especially desirable food for diabetics.

Data on the proximate composition and fuel value of fresh and dry soybeans and a number of soybean products are given here in Table I. Data for the minerals calcium, phosphorus, and iron, are given in Table II.

The light colored varieties of soybeans, either yellow or green, are usually preferred as human food. For use as a green vegetable the Hanto variety is very satisfactory since it softens readily in cooking. Other varieties may be used but they require longer cooking. The Mammoth Yellow soybean is probably the most widely grown and it has been found desirable for table use.

Soybean flour may be prepared from the whole beans, or from the press cake remaining after the oil has been removed from the beans, the latter product being much lower in fat content. Soybean flours are usually lower in fiber than the whole bean meal, because of the removal of some of the coarse fibrous hulls by the process of sifting.

Information on the utilization of soybeans for human food, and on culture and varieties of soybeans, is to be found in Farmers' Bulletins 1617 and 1520, respectively.

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COMPOSITION AND FUEL VALUE OF SOYBEANS AND SOYBEAN PRODUCTS. - TABLE I.

	Water	Protein (N x 5.71)	Fat	Total carbohydrate by difference	Fiber	Ash	Calories Per 100 grams	Per pound
	%	%	%	%	%	%		
Soybeans, green shelled ^{1/}	64.7	12.4	6.3	14.4 ^{4/}	2.2	2.2	163.9	745
Soybean sprouts ^{1/}	82.3	7.8	1.8	7.0	.9	1.07	75.4	340
Soybeans, dry whole seed or whole ground meal ^{2/}	8.0	36.7	18.2	31.7 ^{5/}	5.1	5.37	437.4	1985
Soybean flour (sifted) ^{2/} from the whole bean ^{2/}	6.7	38.3	19.3	31.1 ^{5/}	2.9	4.55	451.3	2045
from the press cake ^{3/}	6.1	43.2	4.5	40.0	2.0	6.20	373.3	1695
Soybean curd or cheese, fresh ^{2/}	83.6	8.6	4.5	2.3	.2	.96	84.1	380
Soybean milk ^{2/}	94.2	2.6	1.4	1.4	----	.37 ^{6/}	28.6	130
Soy sauce ^{2/}	65.2	6.1	1.2	8.5	----	19.0 ^{7/}	69.2	315

MINERALS IN SOYBEANS - TABLE II.

	Water	Calcium	Phosphorus	Iron
	%	%	%	%
Soybeans, green shelled ^{2/}	64.7	0.0789	0.2225	0.0030
Soybeans, dried ^{2/}	8.0	.2057	.580	.0078

^{1/} From U.S. Dept. Agr. Circ. 146.^{2/} From unpublished averages on file in Bureau of Home Economics.^{3/} From Piper and Morse, U.S. Dept. Agr. Bul. 439, (1916), p. 12.^{4/} Available carbohydrate is approximately only 5%.^{5/} Available carbohydrate is approximately only 8%.^{6/} The calcium and phosphorus in soybean milk are much lower than in cow's milk.^{7/} Consists of salt 17.06% and salt-free ash 3.44%.